Liquid Lithium Cooled Beryllium Target

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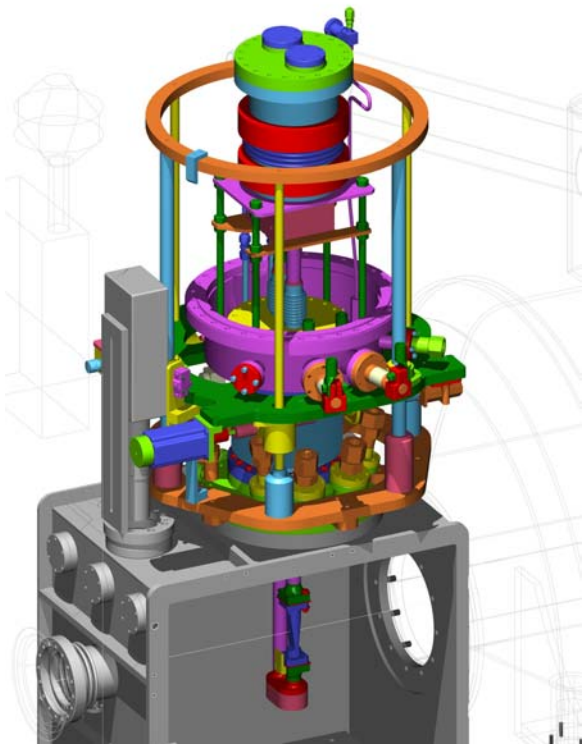
Collaboration with ANL to demonstrate dissipation of one kW of beam power in beryllium/lithium target



FEATURES:

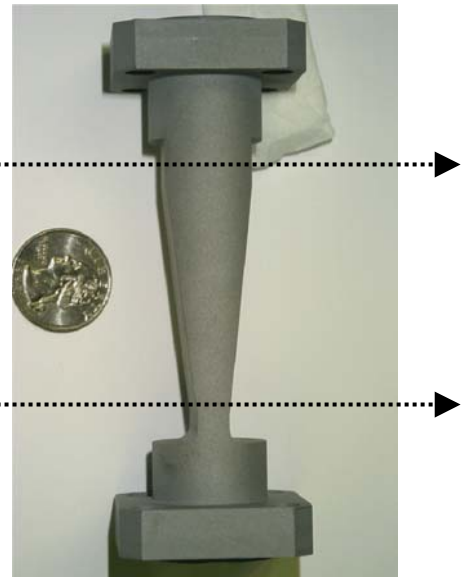
Able to dissipate 1 kW of heavy-ion beam power
Enclosed loop of Li metal (~ liter) in SS-tubes
Shaped beryllium target region,
vertical motion for thickness variation
Pumped by simple Lorentz-force motor
Complete system can be mounted on large CF-flange

Shaped Target piece

Flowing
Liquid Lithium in
5 mm x 10 mm channel

^{16}O
200 MeV/A
1 pμA

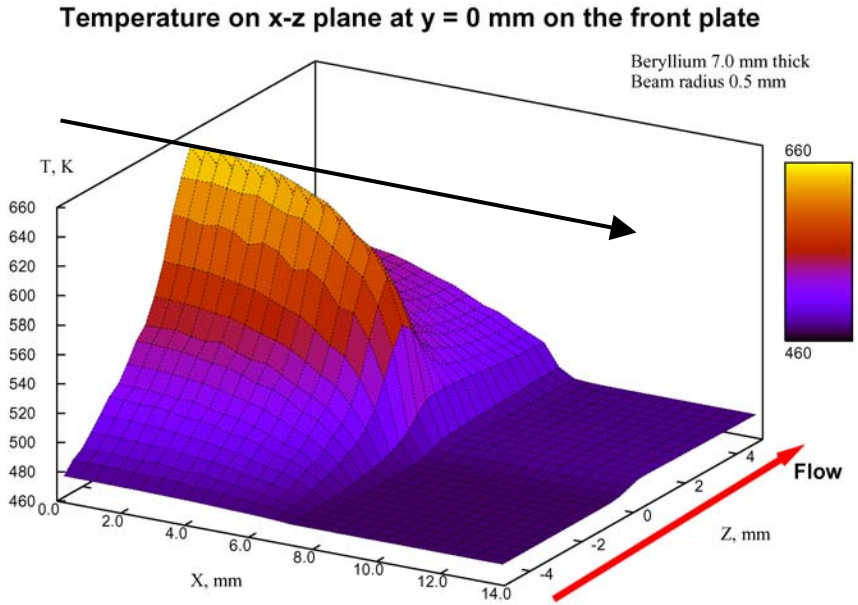
^{48}Ca
160 MeV/A
0.5 pμA



Heat Deposition

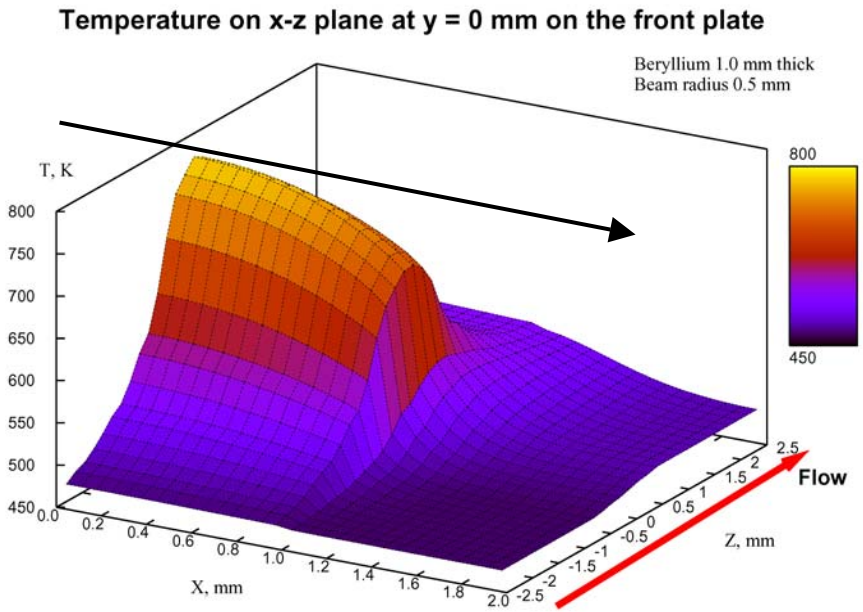
^{16}O, 200 MeV/A
1 pμA

660K



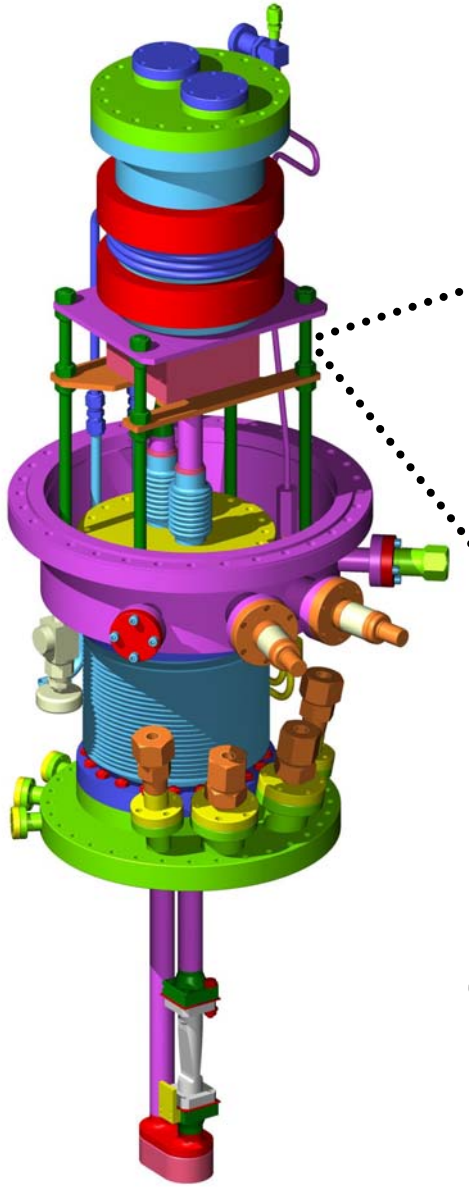
^{48}Ca, 160 MeV/A
0.5 pμA

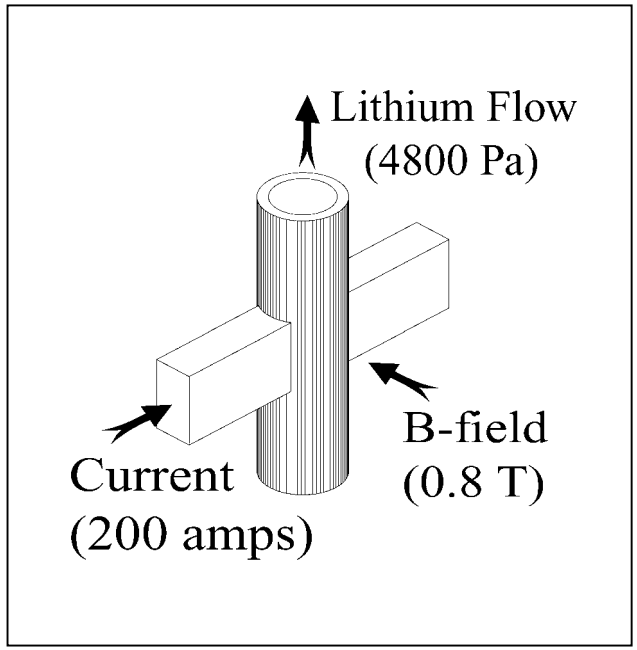
800K



HEIGHTS Code,
A. Hassanein and I. Konkashbaev,
J. Nucl. Mater. **273** (1999) 326

Liquid Flow

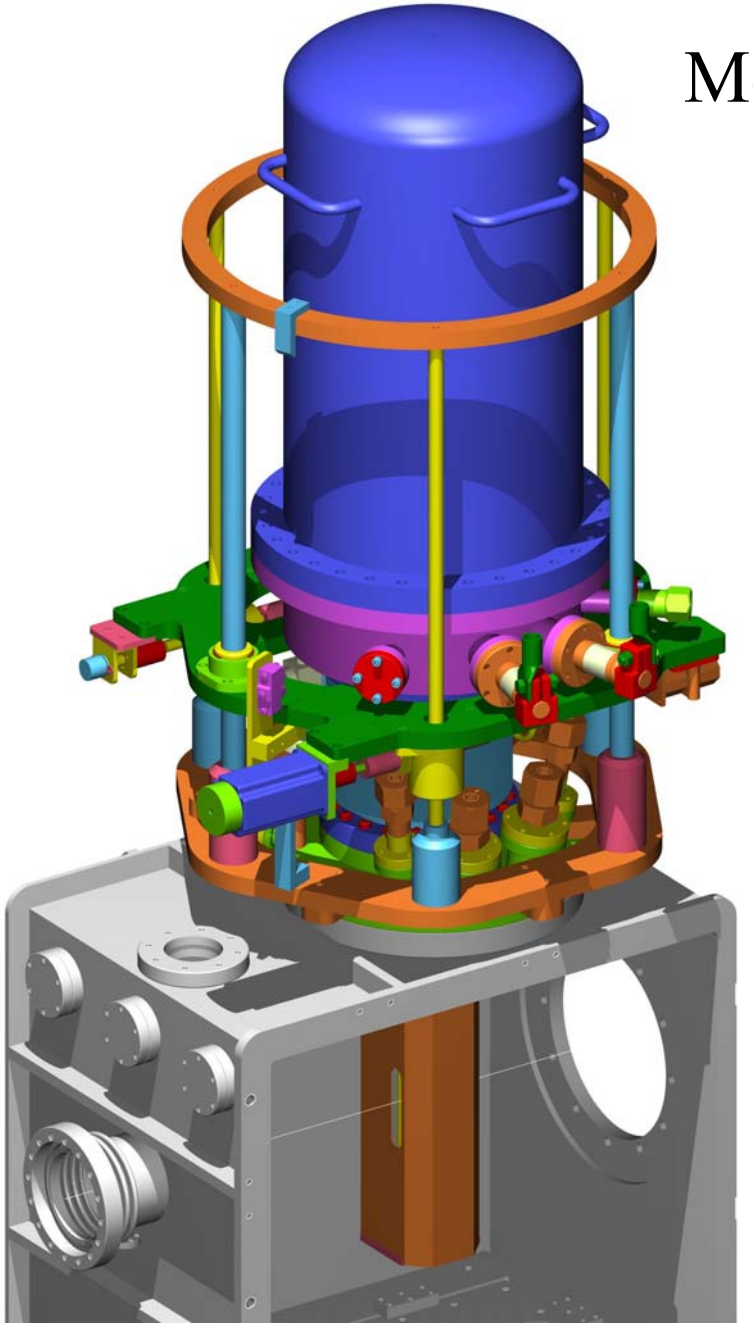




0.2 l/s for 4 m/s in 50 mm^2 target channel

(12.7 mm OD, 9.5 mm ID tube, 71 mm^2)

Mechanical Considerations



Must fit on existing chamber

Vertical motion of entire system

Sealed loop under Argon

Secondary containment

Secondary cooling loop

Liquid Lithium Cooled Hybrid Target

STATUS:

- ANL safety review of system complete
- Mechanical design complete,
  fabrication underway at NSCL
- Plan to load & run-in test at ANL,
  then return to MSU and
  install at A1900 target position